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A New Gated X-Ray Detector for the Orion Laser Facility

SPIE Conference August 2012 San Diego CA

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Imaging x-rays is most easily done with small pinholes in a high-z substrate

Principle of Operation

Front View

- Gating is provided by launching a short (200 ps to several ns) ~1kV voltage pulse across a microstrip transmission line coated on the MCP.

The Orion Laser Facility

The Orion Gated X-Ray Detectors

Orion GXD Block Diagram

Component Locations

Head Improvements

Microwave Stripline Improvements

Connector Landing Design Improvements

Electrical Cross Talk Measurements

Example Cross Talk Measurement Data

Impedance Matching Measurement

Impedance Matching Data

Impedance Matching Data

Embedded Computer Improvements

PC/104+ Stack

Optical Network Switch

Solid State Hard Disk

UNCLASSIFIED

Slide 19

Updated Control Software: LabView Interface

Updated Software: OPC Interface

Mechanical Improvements

When the Orion GXD was born...

Birth Stats...

- Length: 60 inches (152 cm)
- Lid: 12 pounds (6 kg)
 - Reduced 5 pounds (2 kg)
- Air Box: 42 Pounds (19 kg)
 - Reduced 13 pounds (6 kg)
- Total Weight: 121 Pounds (63 kg)
 - Reduced 18 pounds (8 kg)

Front and Rear Covers

EMI Shielding, Strain Relief, SSD Location, LLNL PS

Example Trident Test Data

Timing Shot GXD #3 (Trident Shot 23121)

Associated Timing Data Shot 23121

GXD #1 Trident Shot 23132

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